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OCT 17 2005

## 510(k) SUMMARY

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of the Safe Medical Device Act (SMDA) of 1990 and 21 CFR 807.92.

The assigned 510(k) number is: K052124

**Submitted by:**
American Diagnostica Inc.
500 West Avenue
Stamford, CT 06902
Tel. 203 602-7777
Fax 203 602-2221

**Contact:**
Leigh Ayres
Director of Regulatory Affairs and Quality Assurance
203-602-7777 x 14
or
Clare Santulli
Coagulation Manager and Field Trial Coordinator
Phone: 203 602-7777 x 25

**Summary Prepared:**
July 26, 2005

**Subject Device Information:**
Catalogue number: 824

Device Name: Dilute Prothrombin Time

Proprietary/Trade name: ACTICLOT® dPT™

Common Name: LA test

Classification Name: Prothrombin Time Test

Device Classification: Class II

Regulation Number: Title 21 CFR § 864.7750

Panel: Hematology Reagents

Product Code: GJS

**Predicate Device Information:**

Catalogue numbers: 810 and 815

Device Name: Dilute Russell's Viper Venom Test

Proprietary/Trade name: *DVVtest*® and *DVVconfirm*®

Common Name: LA test

Classification Name: Russell Viper Venom Reagent

Device Classification: Class I

Regulation Number: Title 21 CFR § 864.8950

Panel: Hematology Reagents

Product Code: GIR

K Number: K940490

**Description of the Device:**

ACTICLOT® dPT™ is a test kit. It has three reagents that are used selectively for a screening protocol and a confirmatory protocol. LA Buffer™ is used with dPT Activator™ for the screening protocol. LA Phospholipids™ is used with dPT Activator™ for the confirmatory protocol. ACTICLOT® dPT™ is a professional use qualitative test.

**Intended Use:**

The ACTICLOT® dPT™ is intended for the qualitative determination of lupus anticoagulants (LA) in human plasma. This test is for *in vitro* diagnostic use.

**Summary of Substantial Equivalence:**

ACTICLOT® dPT™ is substantially equivalent to the predicate device *DVVtest*® and *DVVconfirm*® (manufactured by American Diagnostica Inc., Stamford, CT) in performance and intended use. This statement is based on the following criteria: intended use, methodology and test principle, operating procedures, sample requirements, reconstituted stability, specimen, precision, and accuracy from method comparison studies. The summary of substantial equivalence is shown on TABLE 1.

**TABLE 1: Summary of Substantial Equivalence for ACTICLOT® dPT™ and *DVVtest*® and *DVVconfirm*®**

| | ACTICLOT® dPT™ | *DVVtest*® and *DVVconfirm*® |
|---|---|---|
| Intended Use | The ACTICLOT® dPT™ is intended for the qualitative determination of lupus anticoagulants (LA) in human plasma. This test is for *in vitro* diagnostic use | The *DVVtest*® and *DVVconfirm*® are intended for the qualitative determination of lupus anticoagulants (LA) in human plasma. This test is for *in vitro* diagnostic use. |
| Methodology and Test Principle | The dPT Activator™ reagent contains lipidated tissue factor and calcium. When it is mixed with LA Buffer™ in the screening protocol, it is used to initiate clotting in plasma and then instrumentation is used to measure the clot time. In the confirmatory protocol, the dPT Activator™ and LA Phospholipids™ reagent is added to plasma and instrumentation is used to determine clot time. | The reagent, Russell's Viper Venom, in DVVtest is used to initiate clotting in plasma and then instrumentation is used to measure the clot time. The Russell's Viper Venom and phospholipids in DVVconfirm is used to initiate clotting in plasma and then instrumentation is used to measure clot time. |
| Operating Procedures | Lyophilized reagents are reconstituted prior to use and then aliquots of reagents and plasma are combined and then analyzed. There are no calibrators. The kit contains reagents and instructions for a screening protocol, a confirmatory protocol, and mixing studies. | The lyophilized reagents are reconstituted prior to use and then aliquots of reagents and plasma are combined and then analyzed. There are no calibrators. *DVVtest*® reagent is used for the screening test. *DVVconfirm*® reagent is used for the confirmatory test. These two kits contain protocols for mixing studies. |
| Sample Requirements | Blood is drawn with blood collection tubes containing trisodium citrate and then the tubes are centrifuged. Plasma is collected from the tubes and then it is tested. | Blood is drawn with blood collection tubes containing trisodium citrate and then the tubes are centrifuged. Plasma is collected from the tubes and then it is tested. |
| Reconstituted Stability | dPT Activator™ is stable for 24 hours at 18° - 25°C.<br>LA Buffer™ and LA Phospholipids™ are stable for 10 days at 2° - 8°C or at 18° -25°C. | *DVVtest*® and *DVVconfirm*® are stable for 24 hours at 18° -25°C or 5 days at 2°-8°C or 1 month at -20°C. |
| Specimen | Citrated platelet poor plasma | Citrated platelet poor plasma |
| Precision | Equivalent (See TABLE 2) | Equivalent (See TABLE 3) |
| Method Comparison (accuracy) | Equivalent (See TABLES 4 and 5) | Equivalent (See TABLES 4 and 5) |

## Precision

ACTICLOT® dPT™ and *DVVtest*® reagent and the *DVVconfirm*® reagent precision studies were performed by American Diagnostica Inc. and one field trial laboratory using various coagulation analyzers: ACL® 300R centrifugal analyzer, BCT®, MLA® 900C coagulation analyzer, and the STA Compact®. LAtrol™ Abnormal Control (catalogue number 816A) and LAtrol™ Normal Control (catalogue number 816N) were the controls that were tested for the precision evaluation. These precision studies included multiple tests performed over several days. The precision results from the subject device are shown in TABLE 2.

**TABLE 2. Precision Study Results with ACTICLOT® dPT™**

| Coagulation Analyzer | Control | dPT Screening mean (sec) | Intra-Assay CV (%) | Inter-Assay CV (%) | dPT Confirm-atory mean (sec) | Intra-Assay CV (%) | Inter-Assay CV (%) |
|---|---|---|---|---|---|---|---|
| ACL® 300R | 816N | 32.8 | 2.5 | 5.1 | 30.2 | 3.8 | 5.3 |
| | 816A | 63.8 | 1.9 | 7.1 | 36.9 | 3.2 | 3.8 |
| BCT® | 816N | 47.5 | 0.5 | 3.2 | 51.6 | 1.7 | 4.5 |
| | 816A | 89.2 | 0.6 | 5.2 | 61.9 | 1.2 | 3.7 |
| MLA® 900C | 816N | 27.9 | 2.5 | 3.7 | 27.2 | 2.8 | 4.1 |
| | 816A | 51.6 | 2.4 | 8.6 | 30.5 | 1.5 | 3.7 |
| STA Compact® | 816N | 40.2 | 0.8 | 3.4 | 39.7 | 0.9 | 4.3 |
| | 816A | 77.9 | 1.1 | 7.2 | 46.0 | 1.0 | 4.8 |

ND – Not Determined

The results of precision study performed with the predicate device are shown in TABLE 3.

**TABLE 3. Precision Study Results with *DVVtest*® and *DVVconfirm*®**

| Coagulation Analyzer | Control | DVV*test* (sec) mean | Intra-Assay CV (%) | Inter-Assay CV (%) | DVV *confirm* (sec) mean | Intra-Assay CV (%) | Inter-Assay CV (%) |
|---|---|---|---|---|---|---|---|
| ACL® 300R | 816N | 30.4 | 1.4 | ND | 31.3 | 0.6 | ND |
| | 816A | 64.2 | 3.2 | ND | 35.1 | 1.4 | ND |
| BCT® | 816N | 31.8 | 0.3 | 2.4 | 33.2 | 0.5 | 3.7 |
| | 816A | 63.8 | 0.5 | 2.7 | 43.0 | 0.6 | 4.8 |
| MLA® 900C | 816N | 31.0 | 0.9 | 2.9 | 31.7 | 1.3 | 2.3 |
| | 816A | 63.6 | 1.4 | 3.9 | 34.5 | 0.9 | 3.2 |
| STA Compact® | 816N | 36.2 | 0.7 | 3.3 | 34.4 | 0.7 | 3.6 |
| | 816A | 71.9 | 0.9 | 3.8 | 38.9 | 1.3 | 5.6 |

ND Not Determined

*Conclusion concerning the Precision Study:*

Precision data obtained from laboratory field tests and from testing at American Diagnostica Inc. show that ACTICLOT® dPT™ and *DVVtest*® and *DVVconfirm*® are substantially equivalent. The precision data obtained from each instrument is substantially equivalent because the intra-assay CVs were within 3.8% and the inter-assay CVs were within 7.2%. The mean clotting times from the precision studies are shown for informational purposes only. Clotting times of the two comparative methods are not expected to be the same because both the predicate method and subject method have systematic bias[1] based upon differences in mechanism of initiation of clot formation and instrument system bias in assessing clot time of each method.

**Method Comparison (accuracy)**

ACTICLOT® dPT™ method comparison studies were performed at American Diagnostica, Inc. in Stamford, CT (Study 1) and at Centre hospitalier universitaire de Sherbrooke, Fleurimont (Québec), Canada (Study 2). Patient samples were tested using ACTICLOT® dPT™ and *DVVtest*® and *DVVconfirm*®. The accuracy matrix of each study is displayed on TABLE 4 and TABLE 5.

**TABLE 4. Accuracy Matrix of Study 1**

| | Number of samples that were LA positive with *DVVtest*® and *DVVconfirm*® | Number of samples that were LA negative with *DVVtest*® and *DVVconfirm*® |
|---|---|---|
| Number of samples that were LA positive with ACTICLOT® dPT™ | 17 | 5 |
| Number of samples that were LA negative with ACTICLOT® dPT™ | 0 | 32 |

**TABLE 5. Accuracy Matrix of Study 2**

| | Number of samples that were LA positive with *DVVtest*® and *DVVconfirm*® | Number of samples that were LA negative with *DVVtest*® and *DVVconfirm*® |
|---|---|---|
| Number of samples that were LA positive with ACTICLOT® dPT™ | 31 | 8 |
| Number of samples that were LA negative with ACTICLOT® dPT™ | 3 | 50 |

*Conclusion Concerning the Method Comparison Studies:*

The accuracy studies from the laboratory field test and from testing at American Diagnostica Inc. show that ACTICLOT® dPT™ and *DVVtest*® and *DVVconfirm*® are substantially equivalent. In Study 1, 49 out of 54 samples tested (90.7%) were in agreement. In Study 2, 81 out of 93 samples tested (87.1%) were in agreement. The accuracy or agreement of these two methods was between 87.1% and 90.7%.

**Sensitivity Studies:**

Twenty-three prescreened LA positive samples were tested at the Haemotology Department at Univeristy College London, UK with the predicate device, the subject device, and a third commercially available aPTT sensitive LA test (Dade® Actin® FSL Activated PTT Reagent). The test results are shown on TABLE 6.

**TABLE 6. Percent LA Positive Test Results from each of Three LA Tests**

| | ACTICLOT® dPT™ [a] | *DVVtest*®/*DVVconfirm*® [b] | aPTT reagent [b] |
|---|---|---|---|
| Number of Samples that Tested LA Positive with One LA Test / Number of LA Positive Plasmas | 18/23 | 18/23 | 19/23 |
| Percent LA Positive | 78.3% | 78.3% | 82.6% |

(a) Assays were performed using the ACL 300R coagulation analyzer.
(b) Assays were performed using the Sysmex® CA-1500 coagulation analyzer.

*Conclusion Concerning Sensitivity:*

The London study shows that the sensitivity of ACTICLOT® dPT™ and *DVVtest*® and *DVVconfirm*® are substantially equivalent because the subject method identified and the predicate method identified 18 of the 23 LA positive samples. The third method was included for informational purposes.

It is well known, in the haemostasis field, that no one LA test identifies all LA positive samples due to the biochemical heterogeneity among lupus anticoagulants and the heterogeneity among LA test reagents[2,3]. It is recommended that LA positive samples should be identified after testing with a combination of two or more LA tests[2,3]. When the test results from these three methods were combined, 21 of the 23 LA positive samples were identified. The results from the combined tests are shown in TABLE 7. This increased the percent LA positive from 78.3% - 82.6% (with individual tests) to 91.3% when test results were combined.

**TABLE 7. Percent LA Positive Test Results with Two or More LA Positive Tests from Three LA Tests**

| | Samples tested with ACTICLOT® dPT™[a] + *DVVtest*®/*DVVconfirm*®[b] + aPTT reagent[b] |
|---|---|
| Number of Samples that Tested LA Positive with any Two out of Three LA Tests / Number of Known LA Positive Samples | 21/23 |
| Percent LA Positive | 91.3 % |

(a) Assays were performed using the ACL 300R coagulation analyzer.
(b) Assays were performed using the Sysmex® CA-1500 coagulation analyzer.

REFERENCES


1. Tietz, NW. Textbook of Clinical Chemistry. Saunders. 1986: 412-413.

2. Brandt, JT, Triplett, DA, Alving, IS, Scharrer, I. Criteria for the Diagnosis of Lupus Anticoagulants: an Update. On behalf of the Subcommittee on Lupus Anticoagulant/Antiphospholipid Antibody of the Scientific and Standardization Committee of the ISTH. *Thromb Haemost.* 1995: 74(4):1185-90.

3. Johns, AS, Chamley, L, Ocklford, PA, Pattison, NS, Mckay, EJ, Corkill, M, Hart, H. Comparison of Tests for the Lupus Anticoagulant and Antiphopholipid Antibodies in Systemic Lupus Erythematosus. *Clin Exper Rheumatol.* 1994: 12: 523-6.

DEPARTMENT OF HEALTH & HUMAN SERVICES

OCT 17 2005

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

Ms. Leigh Ayres
Director of Regulatory Affairs and Quality Assurance
American Diagnostica, Inc.
500 West Avenue
Stamford, Connecticut 06902

Re: k052124
Trade/Device Name: ACTICLOT® dPT™ Reagent Kit
Regulation Number: 21 CFR § 864.7750
Regulation Name: Prothrombin time test
Regulatory Class: II
Product Code: GJS
Dated: August 3, 2005
Received: August 5, 2005

Dear Ms. Ayres:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific information about the application of labeling requirements to your device, or questions on the promotion and advertising of your device, please contact the Office of In Vitro Diagnostic Device Evaluation and Safety at (240) 276-0484. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 443-6597 or at its Internet address http://www.fda.gov/cdrh/industry/support/index.html

Sincerely yours,

Robert L. Becker, Jr., MD, Ph.D
Director
Division of Immunology and Hematology
Office of *In Vitro* Diagnostic Device
Evaluation and Safety
Center for Devices and
Radiological Health

Enclosure

**INDICATIONS FOR USE STATEMENT**

510(k) Number: K052124

Device name: ACTICLOT® dPT™ reagent kit

**Indications for Use:**

The ACTICLOT® dPT™ is intended for the qualitative determination of Lupus Anticoagulants (LA) in human plasma. The test is for *in vitro* diagnostic use.

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**Concurrence of CDRH, Office of Device Evaluation (ODE)**

☒ Prescription Use (Per 21 CFR 801.109) OR ☐ Over-The-Counter-Use

Division Sign-Off

Office of In Vitro Diagnostic Device Evaluation and Safety

510(k) K052124